



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/084,704	02/26/2002	Gabor Devenyi	01W120	6376
7590 07/25/2007 Raytheon Company Bldg. EO/E01/E150 2000 East El Segundo Boulevard P.O. Box 902 El Segundo, CA 90245			EXAMINER PILKINGTON, JAMES	
			ART UNIT	PAPER NUMBER
			3682	
			MAIL DATE	DELIVERY MODE
			07/25/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/084,704	Applicant(s) DEVENYI, GABOR	
	Examiner James Pilkington	Art Unit 3682	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 May 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 and 17-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 and 17-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 19 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re clm 19, it is unclear to the examiner how the spring pin is "preloaded." What structure provides for the preloading of the spring? How is the spring preloaded? Or does the preloading of the spring happen when the spring is in contact with the wire prior to activation of the leadscrew?

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 3, 5, 6, 7, 8, 9, 18 and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Schwanz, USP 4,227,426.

Re clms 1, 3, 5, 6, 7, 8, 9, 18 and 19, Schwanz disclose a leadscrew assembly comprising:

- A leadscrew operable to rotate about a rotational axis to linearly drive a driven structure comprising:

Art Unit: 3682

- An elongated cylindrical shaft (2, Figure 2, see examiners note)
having an outer lateral surface and a rotational axis (center line)
- A lead screw thread comprising a thread wire (3) helically wrapped
in spaced apart turns upon the lateral surface of the elongated shaft
(2)
- A hollow drive nut housing (6) affixed to the driven structure and
comprising:
 - A nut bore (hole which the shaft extends through, see Figure 2)
having an unthreaded inner surface with the leadscrew being
inserted through the nut bore, the nut bore being sized such that
the leadscrew may rotate therein about the rotational axis
 - A spring pin (7) affixed to the drive nut housing (6) and spanning
across the nut bore (see Figure 2) to engage the leadscrew thread
(3)
 - Wherein the spring pin (7) has a first end (near 8), a second
end (near 9) and a central portion (running between the two
ends)
 - Wherein the ends (near 8,9) are affixed to the drive nut
housing (the ends go around the housing, see Figure 2)
 - Wherein the drive nut comprises a first spring pin retainer
(11) and an oppositely disposed second spring pin retainer
(10)

- Wherein the retainers comprise openings in the nut
(see Figure 2)
 - The central portion spanning an arc across an interior of the nut bore to engage the leadscrew thread (the central portion of the spring pin at 8 spans an arc to engage the thread, see Figure 2)
 - Wherein the drive nut housing (6) has an access point opening (where the central portion of the pin engages the wire, see Figure 2) through which the spring pin (7) is accessible from an exterior of the drive nut housing (6) and providing clearance for the spring pin (7)
 - Wherein the spring pin (7) contacts the leadscrew thread over a portion of a single turn (the pin only contacts a portion of the thread during a full turn)
 - Wherein the spring pin (7) is preloaded (in contact with the thread) to ensure positive contact between the spring pin (7) and the leadscrew thread (3)
- A motor (5) rotationally drives the leadscrew (via the drive nut 6)

**The examiner notes that it is understood that Schwanz discloses a wire as the shaft however a shaft does not have to be a rigid structure according to the claim.

Furthermore, when the wire is in the nut bore it is indeed an elongated "straight" shaft.

If applicant wish to define a shaft as a "rigid" member see below.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-9, 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schwanz, USP 4,227,426, in view of Devenyi, USP 5,636,549.

Re clms 1-9, Schwanz disclose a leadscrew assembly comprising:

- A leadscrew operable to rotate about a rotational axis to linearly drive a driven structure comprising:
 - An elongated cylindrical shaft (2, Figure 2, see examiners note) having an outer lateral surface and a rotational axis (center line)
 - A lead screw thread comprising a thread wire (3) helically wrapped in spaced apart turns upon the lateral surface of the elongated shaft (2)
- A hollow drive nut housing (6) affixed to the driven structure and comprising:
 - A nut bore (hole which the shaft extends through, see Figure 2) having an unthreaded inner surface with the leadscrew being inserted through the nut bore, the nut bore being sized such that the leadscrew may rotate therein about the rotational axis

Art Unit: 3682

- A spring pin (7) affixed to the drive nut housing (6) and spanning across the nut bore (see Figure 2) to engage the leadscrew thread (3)
 - Wherein the spring pin (7) has a first end (near 8), a second end (near 9) and a central portion (running between the two ends)
 - Wherein the ends (near 8,9) are affixed to the drive nut housing (the ends go around the housing, see Figure 2)
 - Wherein the drive nut comprises a first spring pin retainer (11) and an oppositely disposed second spring pin retainer (10)
 - Wherein the retainers comprise openings in the nut (see Figure 2)
 - The central portion spanning an arc across an interior of the nut bore to engage the leadscrew thread (the central portion of the spring pin at 8 spans an arc to engage the thread, see Figure 2)
- Wherein the drive nut housing (6) has an access point opening (where the central portion of the pin engages the wire, see Figure 2) through which the spring pin (7) is accessible from an exterior of the drive nut housing (6) and providing clearance for the spring pin (7)

Art Unit: 3682

- Wherein the spring pin (7) contacts the leadscrew thread over a portion of a single turn (the pin only contacts a portion of the thread during a full turn)
- Wherein the spring pin (7) is preloaded (in contact with the thread) to ensure positive contact between the spring pin (7) and the leadscrew thread (3)
- A motor (5) rotationally drives the leadscrew (via the drive nut 6)

Schwanz does not disclose a rigid drive shaft, a spacer wire having a size smaller than that of the thread wire and helically interwrapped about the shaft with the thread wire and that the thread wire has a circular cross section.

Devenyi teaches that a rigid drive shaft can be used in place of a flexible drive wire (applicant has made a rigid shaft and a flexible shaft functional equivalents in his past disclosure C1/L50-54), a spacer wire (23) having a size smaller than that of the thread wire (22) and helically interwrapped about the shaft (24) with the thread wire (22) and that the thread wire (22) has a circular cross section (Figure 3) for the purpose of providing a leadscrew assembly that is inexpensive and can be made with simple and easily workable components (C1/L35-41 and C1/L44-59).

It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the teachings of Schwanz and provide a rigid drive shaft, a spacer wire having a size smaller than that of the thread wire and helically interwrapped about the shaft with the thread wire and that the thread wire has a circular cross section,

Art Unit: 3682

as taught by Devenyi, for the purpose of providing a leadscrew assembly that is inexpensive and can be made with simple and easily workable components.

7. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schwanz, USP 4,227,426, in view of Devenyi, USP 5,636,549 and further in view of Pan, USP 6,459,844.

Re clms 10 and 11, Schwanz in view of Devenyi discloses all of the claimed subject matter as described above.

Schwanz in view of Devenyi does not disclose that the drive structure includes a linear slide mechanism to which the drive nut housing is affixed so that the drive nut housing does not rotate and that an optical filter is supported on the linear slide mechanism.

Pan teaches a drive structure that includes a linear slide mechanism (18) to which the drive nut housing (30) is affixed so that the drive nut housing (30) does not rotate and that an optical filter (12) is arranged on the linear slide mechanism (18) for the purpose of transmitting the movement of a leadscrew to the slide mechanism to move the filter (C2/L53-55) so that the linear position of the filter can be varied.

It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the teachings of Schwanz in view of Devenyi and provide a drive structure that includes a linear slide mechanism to which the drive nut housing is affixed so that the drive nut housing does not rotate and that an optical filter is arranged on the linear slide mechanism, as taught by Pan, for the purpose of transmitting the movement

Art Unit: 3682

of a leadscrew to the slide mechanism to move the filter so that the linear position of the filter can be varied.

8. Claims 12-15, 17, 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schwanz, USP 4,227,426, in view of Devenyi, USP 5,636,549 and further in view of Pan, USP 6,459,844.

Re clms 12-15, 17, 20 and 21, Schwanz disclose a leadscrew assembly comprising:

- A leadscrew operable to rotate about a rotational axis to linearly drive a driven structure comprising:
 - An elongated cylindrical shaft (2, Figure 2, see examiners note) having an outer lateral surface and a rotational axis (center line)
 - A lead screw thread comprising a thread wire (3) helically wrapped in spaced apart turns upon the lateral surface of the elongated shaft (2)
- A hollow drive nut housing (6) affixed to the driven structure and comprising:
 - A nut bore (hole which the shaft extends through, see Figure 2) having an unthreaded inner surface with the leadscrew being inserted through the nut bore, the nut bore being sized such that the leadscrew may rotate therein about the rotational axis

Art Unit: 3682

- A spring pin (7) affixed to the drive nut housing (6) and spanning across the nut bore (see Figure 2) to engage the leadscrew thread (3)
 - Wherein the spring pin (7) has a first end (near 8), a second end (near 9) and a central portion (running between the two ends)
 - Wherein the ends (near 8,9) are affixed to the drive nut housing (the ends go around the housing, see Figure 2)
 - Wherein the drive nut comprises a first spring pin retainer (11) and an oppositely disposed second spring pin retainer (10)
 - Wherein the retainers comprise openings in the nut (see Figure 2)
 - The central portion spanning an arc across an interior of the nut bore to engage the leadscrew thread (the central portion of the spring pin at 8 spans an arc to engage the thread, see Figure 2)
- Wherein the drive nut housing (6) has an access point opening (where the central portion of the pin engages the wire, see Figure 2) through which the spring pin (7) is accessible from an exterior of the drive nut housing (6) and providing clearance for the spring pin (7)

Art Unit: 3682

- Wherein the spring pin (7) contacts the leadscrew thread over a portion of a single turn (the pin only contacts a portion of the thread during a full turn)
- Wherein the spring pin (7) is preloaded (in contact with the thread) to ensure positive contact between the spring pin (7) and the leadscrew thread (3)
- A motor (5) rotationally drives the leadscrew (via the drive nut 6)

Schwanz does not disclose a rigid drive shaft, a spacer wire having a size smaller than that of the thread wire and helically interwrapped about the shaft with the thread wire and that the thread wire has a circular cross section.

Devenyi teaches that a rigid drive shaft can be used in place of a flexible drive wire (applicant has made a rigid shaft and a flexible shaft functional equivalents in his past disclosure C1/L50-54), a spacer wire (23) having a size smaller than that of the thread wire (22) and helically interwrapped about the shaft (24) with the thread wire (22) and that the thread wire (22) has a circular cross section (Figure 3) for the purpose of providing a leadscrew assembly that is inexpensive and can be made with simple and easily workable components (C1/L35-41 and C1/L44-59).

It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the teachings of Schwanz and provide a rigid drive shaft, a spacer wire having a size smaller than that of the thread wire and helically interwrapped about the shaft with the thread wire and that the thread wire has a circular cross section,

Art Unit: 3682

as taught by Devenyi, for the purpose of providing a leadscrew assembly that is inexpensive and can be made with simple and easily workable components.

Schwanz in view of Devenyi does not disclose that the drive structure includes a linear slide mechanism to which the drive nut housing is affixed so that the drive nut housing does not rotate and that an optical filter is supported on the linear slide mechanism.

Pan teaches a drive structure that includes a linear slide mechanism (18) to which the drive nut housing (30) is affixed so that the drive nut housing (30) does not rotate and that an optical filter (12) is arranged on the linear slide mechanism (18) for the purpose of transmitting the movement of a leadscrew to the slide mechanism to move the filter (C2/L53-55) so that the linear position of the filter can be varied.

It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the teachings of Schwanz in view of Devenyi and provide a drive structure that includes a linear slide mechanism to which the drive nut housing is affixed so that the drive nut housing does not rotate and that an optical filter is arranged on the linear slide mechanism, as taught by Pan, for the purpose of transmitting the movement of a leadscrew to the slide mechanism to move the filter so that the linear position of the filter can be varied.

Also:

Art Unit: 3682

9. Claims 1-15 and 17-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pan '844 in view of Schwanz '426 and further in view of Devenyi '549.

Pan discloses:

- A leadscrew (24) comprising:
 - An elongated shaft (24) that is cylindrical with an outer lateral surface
 - A leadscrew tread
- A driven structure (30, 18/28, 12)
- A hollow drive nut housing (30) affixed to the driven structure and comprising:
 - A nut bore (hole for shaft) sized such that the leadscrew (24) may rotate
- A linear slide mechanism (18/28) to which the drive nut (30) is affixed
- An optical filter (12) supported on the linear slide (18/28)
- A motor (21) that rotationally drives the leadscrew

Pan does not disclose that the thread comprises a wire helically wrapped in spaced apart turns upon the shaft, the nut bore having an untreaded inner surface, a preloaded spring pin affixed to the drive nut housing and spanning across the nut bore to engage the leadscrew thread over a portion of a single turn and an access opening through which the spring pin is accessible, wherein the spring pin has a first end, a

Art Unit: 3682

second end and a central portion, the ends are affixed to the drive nut housing, the drive nut comprises a first spring pin retainer and an oppositely disposed second spring pin retainer, wherein the retainers comprise openings in the nut and the central portion spanning an arc across an interior of the nut bore to engage the leadscrew thread.

Schwanz teaches a thread that comprises a wire helically (3) wrapped in spaced apart turns upon the shaft, the nut bore (inside of 6) having an untreaded inner surface, a preloaded spring pin (7) affixed to the drive nut housing (6) and spanning across the nut bore to engage the leadscrew thread (3) over a portion of a single turn and an access opening (between end walls 10) through which the spring pin is accessible, wherein the spring pin (7) has a first end (near 8), a second end (near 9) and a central portion (running between the two ends), the ends (near 8,9) are affixed to the drive nut housing (the ends go around the housing, see Figure 2), the drive nut comprises a first spring pin retainer (11) and an oppositely disposed second spring pin retainer (10), wherein the retainers comprise openings in the nut (see Figure 2) and the central portion spanning an arc across an interior of the nut bore to engage the leadscrew thread (the central portion of the spring pin at 8 spans an arc to engage the thread, see Figure 2) for the purpose of drive arrangement that is simple to construct and less costly (C1/L23-25).

It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the teachings of Pan and provide a thread that comprises a wire helically wrapped in spaced apart turns upon the shaft, the nut bore having an untreaded inner surface, a preloaded spring pin affixed to the drive nut housing and

Art Unit: 3682

spanning across the nut bore to engage the leadscrew thread over the portion of a single turn and an access opening through which the spring pin is accessible, wherein the spring pin has a first end, a second end and a central portion, the ends are affixed to the drive nut housing, the drive nut comprises a first spring pin retainer and an oppositely disposed second spring pin retainer, wherein the retainers comprise openings in the nut and the central portion spanning an arc across an interior of the nut bore to engage the leadscrew thread, as taught by Schwanz, for the purpose of drive arrangement that is simple to construct and less costly as well as to serve as a simple overload protection between the relatively rotating screw and nut (C1/L23-25, 44-47 and 53-58).

Pan in view of Schwanz does not disclose that the tread wire has a circular cross section and a spacer wire having a size smaller than that of the thread wire and helically interwrapped about the elongated shaft with the thread wire to define a spacing between the turns of the thread wire.

Devenyi teaches a thread wire (16) that has a circular cross section and a spacer wire (17) having a sized smaller than that of the thread wire (16) and helically interwrapped about an elongated shaft (15) with the thread wire (16) to define a spacing between the turns of the thread wire for the purpose of providing a leadscrew thread assembly that is inexpensive and can be made with simple and easily workable components (C1/L35-41 and C1/L44-59).

It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the teachings of Pan in view of Schwanz and provide a thread

Art Unit: 3682

wire that has a circular cross section and a spacer wire having a sized smaller than that of the thread wire and helically interwrapped about an elongated shaft with the thread wire to define a spacing between the turns of the thread wire, as taught by Devenyi, for the purpose or providing a leadscrew thread assembly that is inexpensive and can be made with simple and easily workable components.

Response to Arguments

Applicant's arguments filed 5/22/07 have been fully considered but they are not persuasive.

Ground 1

Regarding the rejection of claim 19 under 35 USC 112 2nd paragraph the applicant argues that support for how the spring is preloaded can be found in paragraphs 0021 and 0022.

The examiner disagrees and argues that these cited section of the specification state that "the spring pin applies a preload to adjacent turns of the leadscrew thread." A spring pin applying a preload, as stated in the specification, is different than a spring being preloaded as claimed in claim 19. It is still unclear to the examiner how the spring pin is being preloaded.

Ground 2

The applicant argues on pages 7-10 that Schwanz does not relate to a leadscrew as described in the present application or as understood in the art.

The examiner argues that the leadscrew is not required to be driven at a proximal or driven end by the claim language. A leadscrew assembly can be arranged so that it can be driven from a point along the middle of the shaft or at an end of the shaft and a leadscrew can be arranged to be a rotating member or a non-rotating member. Claim 1 only recites "a leadscrew operable to rotate about a rotational axis to linear drive a driven structure." No where in the claim is it positively recited that the leadscrew must be driven at a proximal end and must rotate about a rotational axis. The claim only requires that the leadscrew be capable of operating in such a manner. As understood in the art the shaft of a leadscrew assembly can be arranged so that rotation of the shaft causes a nut to translate or rotation of the nut causes the shaft to translate but the claim does not positively recite which is required since the leadscrew must only be "operable to" (capable of). The examiner also notes that while features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function, see MPEP 2114.

The applicant also argues that Schwanz does not disclose a hollow drive nut housing affixed to the driven structure.

Again it is the examiner's position that the claim does not clearly define how the drive nut must be affixed to the driven structure. In the case of Schwanz the drive nut being on the shaft affixes it to the driven structure or if the shaft isn't moved the nut drives the housing to which it is affixed to.

Regarding the applicant's arguments regarding claim 9 it is the examiner's position that the claim does not say how the motor rotationally drives the leadscrew. The claim does not say the motor rotates the lead screw, the claim states the motor rotationally drives the leadscrew. The motor rotationally drives the nut which drives the leadscrew therefore the motor causes a rotation that rotationally drives the leadscrew. If it is the applicant's intent to mean that the motor rotates the leadscrew the claim should be reworded to reflect this.

Regarding the remarks directed towards claim 19 see above. It is the examiner's position that the pin of Schwanz, as best understood, is preloaded to ensure a positive contact.

Ground 3

The applicant argues on pages 10-21 that Schwanz is not properly applied as a reference under 35 USC 103.

In response to applicant's argument that Schwanz is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Schwanz is reasonably pertinent as it pertains to a wire wound shaft and a spring that engages the wire within a nut. See above arguments in "Ground 2" regarding the term "leadscrew."

The applicant argues that Schwanz teaches away from the presently claimed approach. The examiner disagrees because approach to transmitting a force between a nut and a screw shaft is the same as that of the instant applicant. Again the examiner notes that while features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function, see MPEP 2114. It is the examiner's position that Schwanz does indeed disclose the structure required therefore, Schwanz does not teach away from the presently claimed approach. In fact Schwanz teaches "a leadscrew assembly with a wire-wound leadscrew and a spring-pin engagement of a drive nut to the leadscrew" and "relates to a mechanical movement to translate rotational to linear motion" (see the instant application's specification page 1).

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, motivation to combined Schwanz and Devenyi is found in the Devenyi reference and stated above as "for the purpose of providing a leadscrew assembly that is inexpensive and can be made with simple and easily workable components" (C1/L35-41 and C1/L44-59 of Devenyi).

Regarding the applicant's arguments directed specifically to claims 1-4 (pages 16-17) the examiner argues that the leadscrew is not required to be driven at a proximal or driven end by the claim language. A leadscrew assembly can be arranged so that it can be driven from a point along the middle of the shaft or at an end of the shaft and a leadscrew can be arranged to be a rotating member or a non-rotating member. Claim 1 only recites "a leadscrew operable to rotate about a rotational axis to linear drive a driven structure." No where in the claim is it positively recited that the leadscrew must be driven at a proximal end and must rotate about a rotational axis. The claim only requires that the leadscrew be capable of operating in such a manner. As understood in the art the shaft of a leadscrew assembly can be arranged so that rotation of the shaft causes a nut to translate or rotation of the nut causes the shaft to translate but the claim does not positively recite which is required since the leadscrew must only be "operable to" (capable of). It is also the examiner's position that the claim does not clearly define how the drive nut must be affixed to the driven structure. In the case of Schwanz the drive nut being on the shaft affixes it to the driven structure or if the shaft isn't moved the nut drives the housing to which it is affixed to.

Regarding the applicants remark that if the combination of Schwanz in view of Devenyi is made the rest of the embodiment of Figure 2 of Devenyi must be adopted as well.

The examiner disagrees and argues that the Devenyi reference, as applied above is only being used to teach a rigid drive shaft, a spacer wire having a size smaller

Art Unit: 3682

than that of the thread wire and helically interwrapped about the shaft with the thread wire and that the thread wire has a circular cross section, the rest of the embodiment of Figure 2 does not have to be adapted. Furthermore, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

The remainder of the applicant's arguments under "Ground 3" revolve around the concept that if one uses the teachings of Devenyi one must also incorporate the drive nut structure. As noted above, this is not the case and it is the examiner's position that Schwanz discloses the limitations of claims 5, 6, 7, 8, 9, 18 and 19. Schwanz discloses:

- A spring pin (7) affixed to the drive nut housing (6) and spanning across the nut bore (see Figure 2) to engage the leadscrew thread (3)
 - Wherein the spring pin (7) has a first end (near 8), a second end (near 9) and a central portion (running between the two ends)
 - Wherein the ends (near 8,9) are affixed to the drive nut housing (the ends go around the housing, see Figure 2)
 - Wherein the drive nut comprises a first spring pin retainer (11) and an oppositely disposed second spring pin retainer (10)

- Wherein the retainers comprise openings in the nut (see Figure 2)
 - The central portion spanning an arc across an interior of the nut bore to engage the leadscrew thread (the central portion of the spring pin at 8 spans an arc to engage the thread, see Figure 2)
 - Wherein the drive nut housing (6) has an access point opening (where the central portion of the pin engages the wire, see Figure 2) through which the spring pin (7) is accessible from an exterior of the drive nut housing (6) and providing clearance for the spring pin (7)
 - Wherein the spring pin (7) contacts the leadscrew thread over a portion of a single turn (the pin only contacts a portion of the thread during a full turn)
 - Wherein the spring pin (7) is preloaded (in contact with the thread) to ensure positive contact between the spring pin (7) and the leadscrew thread (3)
- A motor (5) rotationally drives the leadscrew (via the drive nut 6)

Ground 4

The applicant argues that the combination of Schwanz in view of Devenyi and further in view of Pan is not proper for the same reasons why Schwanz in view of Devenyi as addressed in Ground 3 is not proper. Since no new argument is being

Art Unit: 3682

presented the examiner directs the applicant to the response to "Ground 3" above. It is the examiner's position that since Schwanz in view of Devenyi is proper Schwanz in view of Devenyi and further in view of Pan is proper.

Ground 5

The applicant presents the same arguments as that of Ground 3 and incorporates by reference all the arguments of Ground 3. The examiner directs the applicant back to the Ground 3.

The only new argument presented in this section of the remarks is that the combination does not render obvious the limitation that "a linear slide mechanism to which the drive nut housing is affixed so that the drive nut housing does not rotate" and "an optical filter is supported on the linear slide mechanism."

The examiner disagrees and argues that Pan does indeed teach these limitations. As can be seen in Figure 1 Pan teaches the use of a linear slide mechanism (18) and an optical filter (12) for the purpose of transmitting the movement of a leadscrew to the slide mechanism to move the filter so that the linear position of the filter can be varied.

Regarding the new grounds of rejection set forth in paragraph 9 above the examiner maintains the same position as set forth in the remarks above. Since the rejection is similar to the rejection set forth in the Office Action submitted by Examiner

Art Unit: 3682

Hansen and dated 06/26/06 the remarks from that Action are hereby incorporated in this response and are as follows:

In response to applicant's argument that Schwanz is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Schwanz is clearly in the field of endeavor as it relates to a screw/nut interaction. Whether it is used in the context of a linear actuated screw or a linear actuated nut, the microcosm that is the direct mechanical relationship between the screw and nut is relevant, and therefor applicable within the 35 USC 103 rejections.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In the instant case, there clearly is motivation to combination Pan and Schwanz in order to have a relatively inexpensive arrangement for transferring forces between a nut and screw shaft as well as to serve as a simple overload protection between the relatively rotating screw and nut as suggested by Schwanz et al (US Pat. 4,227,426) (col. 1/lines 23-25, 44-47 & 53-

58). With regard to incorporating the Devenyi reference, the motivation is to provide a leadscrew thread assembly that is inexpensive and can be made with simple and easily workable components, in other words a thread arrangement that does not need to be machined (C1/L35-41 and C1/L44-59).

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections

Art Unit: 3682

are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Pilkington whose telephone number is (571) 272-5052. The examiner can normally be reached on Monday-Friday 8:00AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on (571) 272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JP

JP
7/19/07


RICHARD RIDLEY
SUPERVISORY PATENT EXAMINER